

Applicant : Jian Bai, Steven M. Fischer and J. Michael Flanagan
Appl. No. : Unknown
Examiner : Nguyen, Kiet T.
Docket No. : 10980322-5

Amendments to the Claims

Please cancel claims 1-33 and insert the following new claims 34-50.

1-33. (Cancelled)

34. (New) An apparatus for ionizing at least one analyte in a sample for delivery to a mass analysis device, comprising:

- (a) an ionization enclosure including a passageway configured for delivery of ions to the mass analysis device;
- (b) means to maintain said ionization enclosure at an ambient pressure of greater than 100 mTorr;
- (c) a means for containing in said ionization enclosure at said ambient pressure;
- (d) a source of laser energy including means associated with said ionization enclosure for directing the laser energy onto said sample at said ambient pressure to desorb and ionize at least a portion of said analyte in the sample, and
- (e) means for directing the portion into said passageway.

35. (New) The apparatus of claim 34 wherein the means for containing said sample is selected from the group consisting of a matrix located on a surface, one or more wells of a multi-well microtitre plate, a microchip array, a thin layer chromatographic plate, an electrophoresis gel, and a membrane, and combinations thereof.

36. (New) The apparatus of claim 34 wherein the sample containing means is any conventional single or multi-chambered containment article.

37. (New) The apparatus claim 34 wherein the sample containing means comprises a flowing or static liquid sample.

38. (New) The apparatus of claim 34 wherein the mass analysis device is a mass spectrometer.

39. (New) The apparatus of claim 34 wherein the source of laser energy is selected from a laser operated at ultraviolet (UV), visible (VIS) or infrared (IR) wavelengths or combinations thereof.

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40. (New) The apparatus of claim 34 wherein the ambient pressure is atmospheric pressure.

41. (New) An apparatus for mass analysis of at least one analyte in a sample, comprising:

- (f) an ion source having an ionization enclosure and a mass analysis device having a mass analysis enclosure, said ionization enclosure being connected with said mass analysis enclosure through a passageway configured for delivery of ions from the ion source to the mass analysis device, said ion source including:
 - (1) a holder configured for maintaining a matrix containing a sample in the ionization enclosure at ambient pressure;
 - (2) a source of laser energy directed onto a matrix maintained by said holder at ambient pressure to desorb and ionize at least a portion of said at least one analyte in the sample, and
 - (3) means for directing the portion into said passageway; and
- (g) means to maintain said ionization enclosure at an ambient pressure greater than 100 m Torr while maintaining said mass analysis enclosure at a pressure less than about 10^{-5} Torr.

42. (New) The apparatus of claim 41 wherein the mass analysis device is selected from the time-of-flight, ion trap, quadrupole, Fourier transform ion cyclotron resonance, magnetic sector, or electric sector, or combinations thereof.

43. (New) The apparatus of claim 41 wherein the laser energy is selected from the group consisting of ultraviolet (UV), visible (VIS), and infrared (IR) wavelengths.

44. (New) The apparatus of claim 41 wherein the matrix is in a location selected from the group consisting of located on a surface, in one or more wells of a multi-well microtitre plate, in a microchip array, from a thin layer chromatographic plate, from an electrophoresis gel, from a membrane, or from a static or flowing liquid, or combinations thereof.

45. (New) The apparatus of claim 41 wherein the ionization enclosure contains a gas selected from the group consisting of air, helium, nitrogen, argon, oxygen, and carbon dioxide.

46. (New) The apparatus of claim 41 wherein the source of laser energy is selected from the group consisting of an ultraviolet (UV), visible (VIS) or (IR) infrared laser.

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47. (New) The apparatus of claim 41 wherein the ambient pressure is atmospheric pressure.

48. (New) The apparatus of claim 34 wherein the ambient pressure of the ionization enclosure is maintained between about +15% and -15% of atmospheric pressure.

49. (New) The apparatus of claim 34 wherein the ionization enclosure is maintained at a temperature between about -20°C and +100°C.

50. (New) Mass analysis apparatus including a matrix-assisted laser desorption and ionization (MALDI) source and a mass analysis device that receives and analyzes ions from the MALDI source, wherein the improvement comprises means for maintaining the MALDI source at an ambient pressure greater than 100 mTorr during the desorption and ionization.